

Claims

[c1] 1. A method of combining a channel quality estimate for a radio channel based on a direct measurement of carrier and interferer energies, and a channel quality estimate for the radio channel based on channel decoder metrics, to obtain a better overall estimate of the carrier-to-interference (C/I) ratio measure of the channel quality for the radio channel, said method comprising: obtaining a direct channel quality estimate based on carrier and interferer energies; obtaining a channel decoder metric based channel quality estimate; computing a confidence level, $P(\text{direct})$, for the direct channel quality estimate, and a confidence level, $P(\text{metric})$, for the decoder metric channel quality estimate wherein, $0 \leq P(\text{direct}) \leq 1$, $0 \leq P(\text{metric}) \leq 1$, and $P(\text{direct}) + P(\text{metric}) = 1$; multiplying $P(\text{direct})$ by the direct channel quality estimate and $P(\text{metric})$ by the decoder metric channel quality estimate; and adding the respective products to obtain a final channel quality estimate in terms of the carrier-to-interference (C/I) ratio for the radio channel.

[c2] 2. The method of claim 1 further comprising: storing the previous N direct channel quality estimates; and storing the previous N decoder metric-based channel quality estimates.

[c3] 3. The method of claim 2 wherein $P(\text{direct})$ is a function of the standard deviation σ_{direct} of the previous N direct channel quality estimates, and the standard deviation σ_{metric} of the previous N decoder metric-based channel quality estimates, wherein $P(\text{direct})$ is equal to $\sigma_{\text{metric}} / (\sigma_{\text{direct}} + \sigma_{\text{metric}})$.

[c4] 4. The method of claim 2 wherein $P(\text{metric})$ is a function of the standard deviation σ_{direct} of the previous N direct channel quality estimates, and the standard deviation σ_{metric} of the previous N decoder metric-based channel quality estimates, wherein $P(\text{metric})$ is equal to $\sigma_{\text{direct}} / (\sigma_{\text{direct}} + \sigma_{\text{metric}})$.

[c5] 5. The method of claim 1 wherein $P(\text{direct})$ is set to 0 when $C/I(\text{direct})$ is significantly greater than $C/I(\text{metric})$.

[c6] 6. The method of claim 1 wherein P(metric) is set to 0 when both C/I(metric) and C/I(direct) are greater than a first threshold.

[c7] 7. The method of claim 1 wherein the final channel quality estimate is used for adaptive multi-rate (AMR) codec mode adaptation.

[c8] 8. A system for combining a channel quality estimate for a radio channel based on a direct measurement of carrier and interferer energies, and a channel quality estimate for the radio channel based on channel decoder metrics, to obtain a better overall estimate of the carrier-to-interference (C/I) ratio measure of the channel quality for the radio channel, said system comprising:
means for obtaining a direct channel quality estimate based on carrier and interferer energies;
means for obtaining a channel decoder metric based channel quality estimate;
means for computing a confidence level, P(direct), for the direct channel quality estimate, and a confidence level, P(metric), for the decoder metric channel quality estimate wherein,
 $0 \leq P(\text{direct}) \leq 1$, $0 \leq P(\text{metric}) \leq 1$, and $P(\text{direct}) + P(\text{metric}) = 1$;
means for multiplying P(direct) by the direct channel quality estimate and P(metric) by the decoder metric channel quality estimate; and
means for adding the respective products to obtain a final channel quality estimate in terms of the carrier-to-interference (C/I) ratio for the radio channel.

[c9] 9. The system of claim 8 further comprising:
means for storing the previous N direct channel quality estimates; and
means for storing the previous N decoder metric-based channel quality estimates.

[c10] 10. The system of claim 9 further comprising means for computing P(direct) as a function of the standard deviation σ_{direct} of the previous N direct channel quality estimates, and the standard deviation σ_{metric} of the previous N decoder metric-based channel quality estimates, wherein P(direct) is equal to $\sigma_{\text{metric}} / (\sigma_{\text{direct}} + \sigma_{\text{metric}})$.

[c11] 11. The system of claim 9 further comprising means for computing P(direct) as

a function of the standard deviation σ_{direct} of the previous N direct channel quality estimates, and the standard deviation σ_{metric} of the previous N decoder metric-based channel quality estimates, wherein $P(\text{metric})$ is equal to $\sigma_{\text{direct}} / (\sigma_{\text{direct}} + \sigma_{\text{metric}})$.

[c12] 12. The system of claim 8 further comprising means for setting $P(\text{direct})$ to 0 when $C/I(\text{direct})$ is significantly greater than $C/I(\text{metric})$.

[c13] 13. The system of claim 8 further comprising means for setting $P(\text{metric})$ to 0 when both $C/I(\text{metric})$ and $C/I(\text{direct})$ are greater than a first threshold.

[c14] 14. The system of claim 8 wherein the final channel quality estimate is used for adaptive multi-rate (AMR) codec mode adaptation.